

## Bar Model Representation

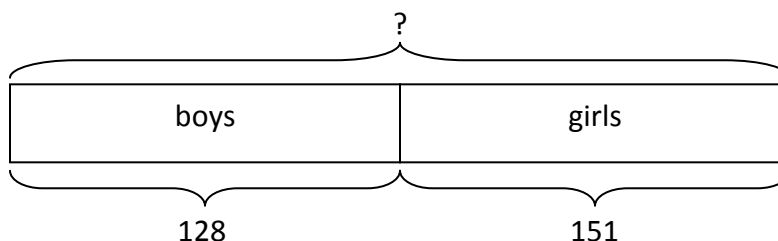
The bar model method is designed to help students solve math word problems accurately and efficiently. Using simple bar drawings, students model mathematical relationships and identify known and unknown quantities. The model provides students with a powerful image that organizes information and simplifies the problem solving process. By modeling increasingly complex word problems, students develop strong reasoning skills which will facilitate the transition from arithmetic to algebra.

Here are a variety of situations in which bar models can be utilized.

### Part-Whole Model for Addition and Subtraction

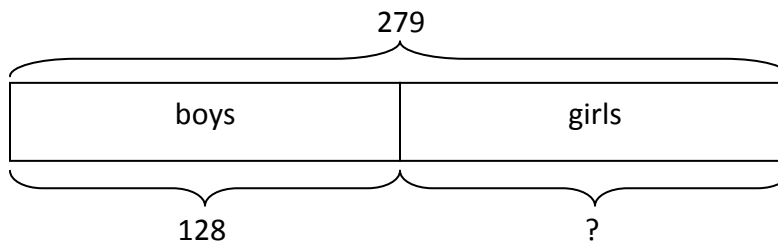
**128 boys and 151 girls took part in a reading contest. How many children took part in the contest?**

We know the 2 parts. To find the whole, we add  $128 + 151$ .



**279 children took part in a reading contest. There are 128 boys. How many girls are there?**

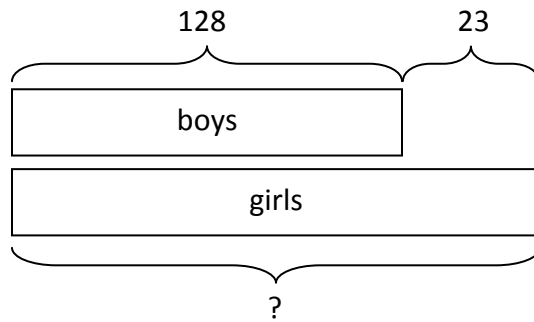
We know the whole and 1 part. To find the missing part, we subtract  $279 - 128$ .



## Comparison Model for Addition and Subtraction

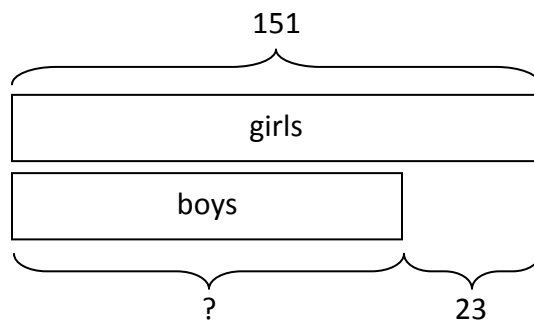
**128 boys took part in a reading contest. 23 more girls than boys took part. How many girls took part in the contest?**

We are comparing the boys to the girls. We know the smaller quantity. To find the bigger quantity we add  $128 + 23$ .



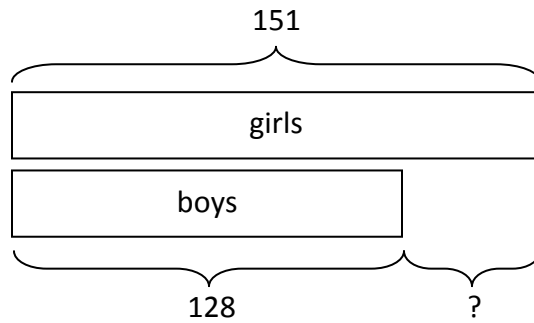
**151 girls took part in a reading contest. 23 fewer boys than girls took part. How many boys took part in the contest?**

We are comparing the girls to the boys. We know the bigger quantity. To find the smaller quantity we subtract  $151 - 23$ .



**151 girls and 128 boys took part in a reading contest. How many more girls than boys took part in the contest?**

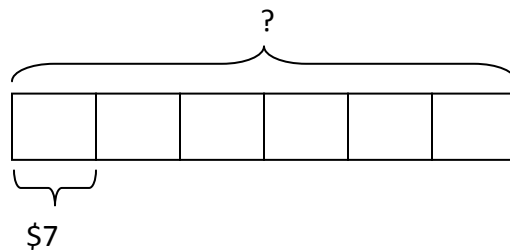
We are comparing the girls to the boys. To find the difference we subtract  $151 - 128$



### Part-Whole Model for Multiplication and Division

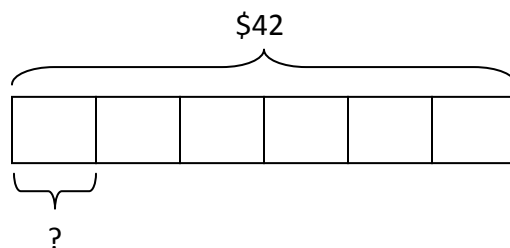
**Henry saved \$7 a week for 6 weeks. How much did he save altogether?**

We know 1 part and the number of parts. To find the whole we multiply  $7 \times 6$ .



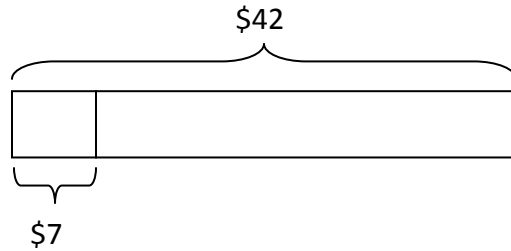
**Henry saved \$42 in 6 weeks. How much did he save each week?**

We know the whole and the number of parts. To find the one part we divide  $42 \div 6$ .



**Henry saves \$7 each week. How many weeks will it take him to save \$42?**

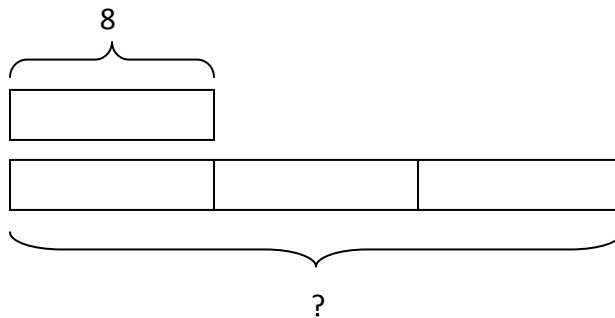
We know the whole and one part. To find the number of parts we divide  $42 \div 7$ .



### Comparison Model for Multiplication and Division

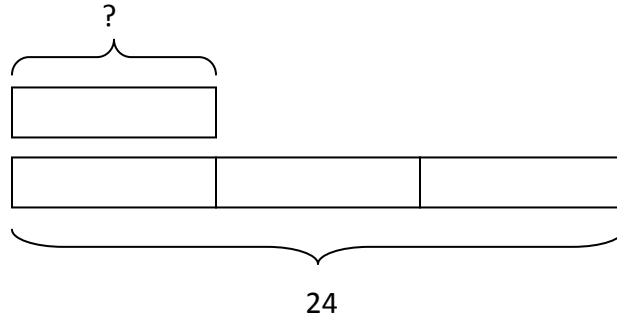
**There are 8 horses on the farm. There are 3 times as many cows as horses. How many cows are there?**

Two quantities are compared. One is a multiple of the other. We know the smaller quantity. To find the bigger quantity we multiply  $8 \times 3$ .



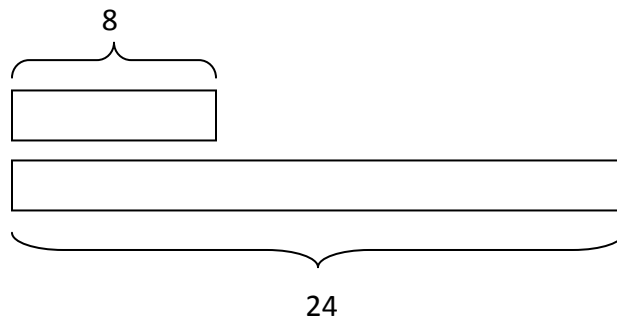
**There are 24 cows on the farm. There are 3 times as many cows as horses. How many horses are there?**

Two quantities are compared. One is a multiple of the other. We know the bigger quantity. To find the smaller quantity we divide  $24 \div 3$ .



**There are 24 cows and 8 horses on the farm. How many times the number of horses would equal the number of cows?**

Two quantities are compared. One is a multiple of the other. We know the smaller quantity. We know both the quantities. To find the multiplier we divide  $24 \div 8$ .



## Fraction Models

**Mia has 27 fish in her fish tank.  $\frac{2}{3}$  are goldfish. How many fish are goldfish?**

